

CLAIMS

1. A curable rapid prototyping composition comprising:
  - (i) one or more aromatic epoxies; and
  - (ii) one or more aliphatic epoxies;wherein said composition, after full cure, has a heat deflection temperature (1.82 MPa) of at least 105°C and an elongation at break of at least 1.5%.
2. The composition of claim 1, wherein said composition comprises two or more aromatic epoxies.
- 10 3. The composition according to any one of claims 1-2, wherein said composition comprises at least 25 wt%, relative to the total weight of the composition, of said one or more aromatic epoxies.
4. The composition according to any one of claims 1-2, wherein said composition comprises at least 50 wt%, relative to the total weight of the composition, of said one or more aromatic epoxies.
- 15 5. The composition according to any one of claims 1-4, wherein said composition further comprises one or more oxetanes.
6. The composition according to claim 5, wherein said composition comprises 5-40 wt%, relative to the total weight of the composition, of said one or more oxetanes.
- 20 7. The composition according to any one of claims 1-6, wherein said one or more aliphatic epoxies consist essentially of epoxies comprising a cycloaliphatic ring structure.
8. The composition according to any one of claims 1-7, wherein said one or more aliphatic epoxies include an epoxy comprising two cyclohexene oxide structures.
- 25 9. The composition according to any one of claims 1-8, wherein said composition comprises 5-30 wt% of said one or more aliphatic epoxies.
10. The composition according to any one of claims 1-9, wherein said composition comprises an epoxy having no more than one epoxy group.
- 30 11. The composition according to any one of claims 1-10, wherein said composition further comprises one or more free radical polymerizable components.

12. The composition of claim 11, wherein said one or more free radical polymerizable components include a component having 5 or 6 (meth)acrylate groups.
13. The composition according to any one of claims 11-12, wherein said composition comprises 5-25 wt%, relative to the total weight of the composition, of said one or more free radical polymerizable component.
14. The composition according to any one of claims 1-13, wherein said one or more aromatic epoxies include a phenol epoxy novolac and/or a cresol epoxy novolac.
- 10 15. The composition according to any one of claims 1-14, wherein said one or more aromatic epoxies includes a bisphenol diglycidyl ether.
16. The composition according to any one of claims 1-15, wherein said composition comprises a (meth)acrylate functional pentaerythritol derivative.
17. The composition according to any one of claims 1-16, wherein said composition further comprises a cationic photoinitiator and a free radical photoinitiator.
- 15 18. The composition according to any one of claims 1-17, wherein said composition comprises about 0-4 wt% of hydroxy-functional components that are absent a curable group and are not selected from the group consisting of photoinitiators.
- 20 19. The composition according to any one of claims 1-18, wherein said heat deflection temperature is at least 115°C.
20. The composition according to any one of claims 1-18, wherein said heat deflection temperature is at least 125°C.
- 25 21. The composition according to any one of claims 1-20, wherein said elongation to break is at least 2%.
22. The composition according to any one of claims 1-20, wherein said elongation to break is at least 3%.
23. The composition according to any one of claims 1-22, wherein said composition has an E10 cure speed of less than 80 mJ/cm<sup>2</sup>.
- 30 24. The composition according to any one of claims 1-23, wherein said composition has a viscosity of less than 750 mPas at 30°C.
25. The composition according to any one of claims 1-24, wherein said composition, after full cure, has a tensile strength of at least 35 MPa.

26. The composition according to any one of claims, wherein said composition, after full cure, has a modulus of at least 2000 MPa.
27. The composition according to any one of claims 1-26, wherein said composition comprises a color-changing dye.
- 5 28. A curable composition having an E10 cure speed of less than 80 mJ/cm<sup>2</sup> and, after cure by radiation and heat, a heat deflection temperature (1.82 MPa) of at least 125°C and an elongation at break of at least 2.5%.
29. The composition according to any one of claims 1-28, wherein said composition comprises, relative to the total weight of the composition, about 0  
10 wt% filler.
30. A rapid prototyping process comprising:
  - (1) coating a layer of a composition according to any one of claims 1-29 onto a surface;
  - (2) exposing said layer imagewise to actinic radiation to form an imaged  
15 cross-section;
  - (3) coating a layer of said composition according to any one of claims 1-29 onto the previously exposed imaged cross-section;
  - (4) exposing said layer from step (3) imagewise to actinic radiation to form an additional imaged cross-section;
  - (5) repeating steps (3) and (4) a sufficient number of times to form a three-dimensional article.
31. An article obtainable by the process of claim 30.
32. Use of a curable rapid prototyping composition comprising one or more aromatic epoxies, one or more aliphatic epoxies for making a three  
25 dimensional article, whereby the article has a heat deflection temperature (at 1.82 MPa) of at least 105°C and an elongation at break of at least 1.5%.
33. Use according to claim 32, whereby has a heat deflection temperature (1.82 MPa) of at least 125 °C.
34. Use according to claims 32 or 33, wherein the article has an elongation at  
30 break of at least 2.5%.